

to sense the back-pressure in block 50. In decision block 51, the back-pressure is checked to determine if it is greater than -1 inch of water. If so, then the vacuum valve is activated in block 54 to allow the air accumulated in the local reservoir to be drawn into the vacuum reservoir, thus lowering the back-pressure. The
5 process then returns to block 50. In decision block 51, if the back-pressure is less than -1 inch of water, then in block 52 the vacuum valve 42 is deactivated to prevent any further air or fluid from reaching the vacuum reservoir 44. In block 56, the pressure is checked to determine if it is less than -2 inches of water. If it is not then the first regulator valve 40 is deactivated in block 58 to prevent fluid from
10 the fluid inlet 26 from entering the local reservoir and increasing the pressure.

The process would then return to block 50. In block 56, if the pressure is less than -2 inches of water, then in block 60, the first regulator valve 40 is activated to allow fluid to flow into the local reservoir 34 from fluid inlet 26 thus raising the pressure within local reservoir 34. If the printhead is expelling fluid at a volumetric
15 rate greater than the fluid entering the first regulator valve 40, however, the amount of fluid within local reservoir 34 will decrease, and the pressure inside it will continue to drop. In decision block 62, the pressure is checked to determine if

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the maximum negative pressure of -6 inches of water is reached. If it has not been reached, then the second regulator valve 38 is deactivated in block 64 and the process returns to block 50. If the maximum negative pressure of -6 inches of
20 water has been reached, then in block 66, the second regulator valve 38 is activated to increase the flow of fluid into the local reservoir 34. The process then returns to sensing the back-pressure in block 50. By performing these steps, the back-pressure within local reservoir 34 can be maintained within an exemplary
25 tight range of -2 to -6 inches of water. If the air released from the fluid in local reservoir 34 over time causes the minimum negative pressure to increase from -2 to -1 inches of water, then the vacuum valve will be activated to expel the air

... side local reservoir 34 so as to prevent the back pressure from getting higher.